Part 9 · Spot the Mistake

Each solution below reaches a wrong answer, and exactly one step is to blame. Find the first wrong step and rewrite it correctly. Marking other people's work is the fastest way to stop making their mistakes.

□ Spot the Mistake

Finding the distance between (2, 3) and (4, 1)

Step 1. Substitute into the distance formula: $d = \sqrt{¿¿}$.

Step 2. $¿\sqrt{2^2 + ¿¿}$.

Step 3. So the two points are the same point.

_____ The first wrong step is Step _____ . What should it say?

_____

□ Spot the Mistake

Deciding whether three points are collinear

Step 1. For P(1, 5), Q(2, 3), R(−2, −11): $PQ = \sqrt{1+4} = \sqrt{5}$, $QR = \sqrt{16+196} = \sqrt{212}$, $PR = \sqrt{9+256} = \sqrt{265}$.

Step 2. Since $\sqrt{5} + \sqrt{212} \neq \sqrt{265}$ exactly by inspection, the points are not collinear.

Step 3. So P, Q, R form a triangle.

_____ The first wrong step is Step _____ . What should it say?

_____

□ Spot the Mistake

Using the section formula for a ratio written as m1 : m2

Step 1. P divides A(−6,10) and B(3,−8) in the ratio $m_1 : m_2$, so $x = \dfrac{m_1 x_2 + m_2 x_1}{m_1 + m_2}$.

Step 2. Substituting, the x-coordinate formula becomes $x = \dfrac{m_1(-6) + m_2(3)}{m_1 + m_2}$.

Step 3. So a point nearer A gets the larger share of m_1.

_____ The first wrong step is Step _____ . What should it say?

_____

Two questions — how far, and what point lies between — turn out to answer almost every "what shape is this?" question coordinate geometry can ask. Distance and section: that is the whole chapter. □□